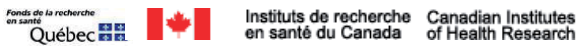


Divulgations

- Bourses de recherche et support financier:



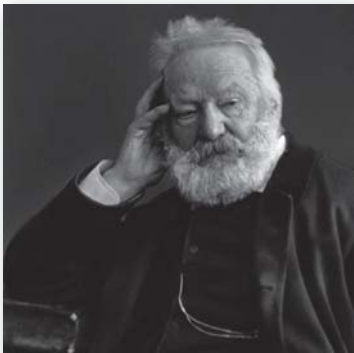
- Support de recherche (sans restriction):



- Conférencier:



« On résiste à l'invasion des armées; on ne résiste pas à l'invasion des idées. »



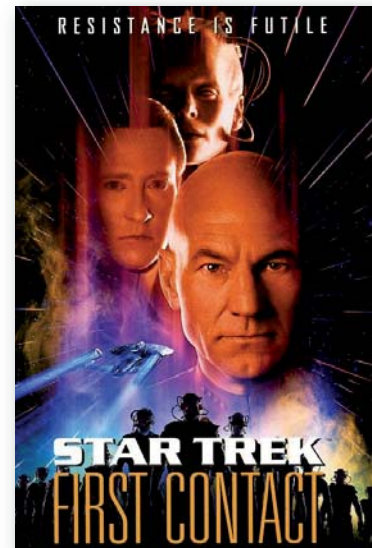
Synthèse des cours de science de base

André Denault MD PhD FRCPC, CSPQ, ABIM-CCM, FASE
Président de la section cardiovasculaire de la SCA
Professeur agrégé de clinique
Département d'anesthésiologie
Service des soins intensifs
Institut de Cardiologie de Montréal
Centre Hospitalier Universitaire de Montréal



Montréal le 11 décembre 2013
FCCS

Université de Montréal



1988



LES ÉCHOGRAPHIES CIBLÉES RÉALISÉES À L'URGENCE PAR DES MÉDECINS NON RADIOLOGISTES

Lignes directrices

du Collège des médecins du Québec

« L'utilisation de l'échographie ciblée par le médecin exerçant à l'urgence est indiquée dans les conditions cliniques suivantes :... »

évaluation du patient en choc
ou en arrêt cardiaque..... »

JANVIER 2008



COLLÈGE DES MÉDECINS
DU QUÉBEC
Une médecine de qualité
au service du public

Focused Cardiac Ultrasound in the Emergent Setting: A Consensus Statement of the American Society of Echocardiography and American College of Emergency Physicians

Arthur J. Labovitz, MD, FASE, Chair,* Vicki E. Noble, MD, FACEP,** Michelle Bierig, MPH, RDCE, FASE,*
Steven A. Goldstein, MD,* Robert Jones, DO, FACEP,** Smadar Kort, MD, FASE,*
Thomas R. Porter, MD, FASE,* Kirk T. Spencer, MD, FASE,* Vivek S. Tayal, MD, FACEP,**
and Kevin Wei, MD,* *St. Louis, Missouri; Boston, Massachusetts; Washington, District of Columbia; Cleveland, Ohio;
Stony Brook, New York; Omaha, Nebraska; Chicago, Illinois; Charlotte, North Carolina; Portland, Oregon*

Table 1 Goals of the focused cardiac ultrasound in the symptomatic emergency department patient

Assessment for the presence of pericardial effusion
Assessment of global cardiac systolic function
Identification of marked right ventricular and left ventricular enlargement
Intravascular volume assessment

Journal of the American Society of Echocardiography
December 2010



CHEST

Consensus Statement

American College of Chest Physicians/ La Société de Réanimation de Langue Française Statement on Competence in Critical Care Ultrasonography*

Paul H. Mayo, MD; Yannick Beaulieu, MD; Peter Doelken, MD;
David Feller-Kopman, MD; Christopher Harrod, MS; Adolfo Kaplan, MD;
John Orpello, MD; Antoine Vieillard-Baron, MD; Olivier Axler, MD;
Daniel Lichtenstein, MD; Eric Maury, MD; Michel Slama, MD;
and Philippe Vignon, MD

(CHEST 2009; 135:1050–1060)

Circulatory Shock

Jean-Louis Vincent, M.D., Ph.D., and Daniel De Backer, M.D., Ph.D.

attention, and peripheral edema. The diagnosis can be refined with point-of-care echocardiographic evaluation, which includes assessment for pericardial effusion, measurement of left and right ventricular size and function, assessment for respiratory variations in vena cava dimensions, and calculation of the aortic velocity–time integral, a measure of stroke volume. Whenever possible, focused echocardiography should be performed as soon as possible in any patient presenting with shock (Fig. 1A).^{5,6}

The NEW ENGLAND JOURNAL of MEDICINE

REVIEW ARTICLE

CRITICAL CARE MEDICINE

Simon R. Finfer, M.D., and Jean-Louis Vincent, M.D., Ph.D., Editors

Circulatory Shock

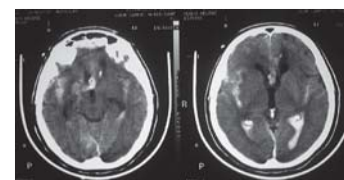
Jean-Louis Vincent, M.D., Ph.D., and Daniel De Backer, M.D., Ph.D.

N ENGL J MED 369:18 NEJM.ORG OCTOBER 31, 2013

Hypoxémie et instabilité hémodynamique

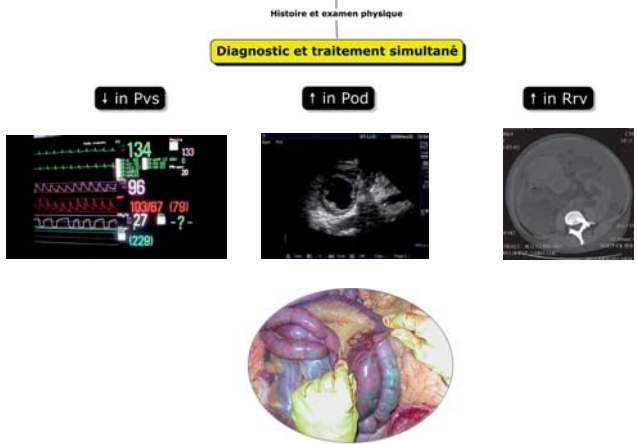


Hypoxémie et instabilité hémodynamique



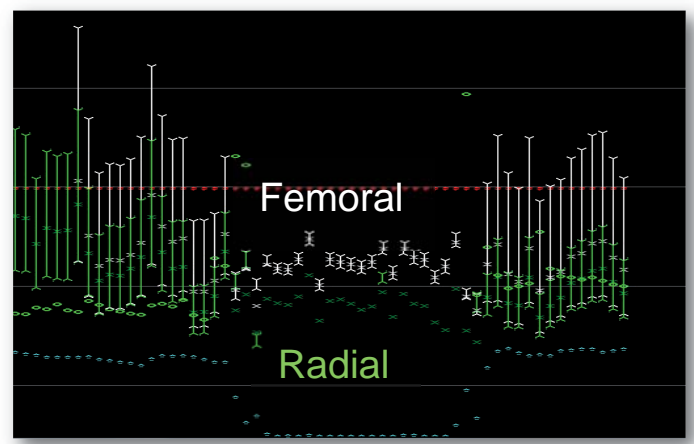
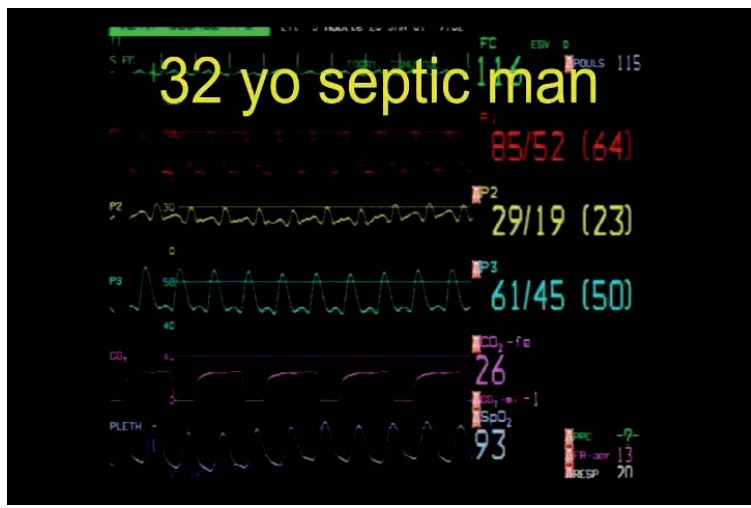
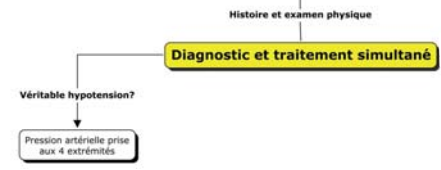
♀ de 34 ans hémorragie sous-arachnoïdienne

Hypoxémie et instabilité hémodynamique

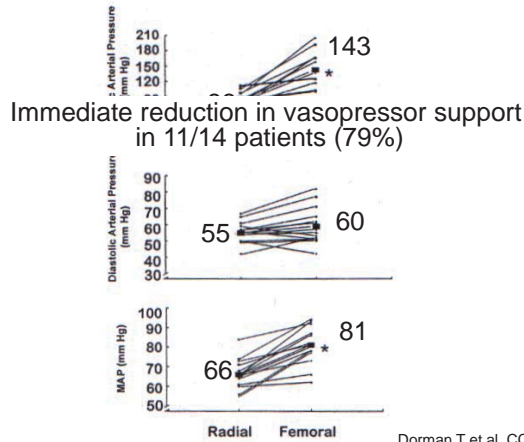


♀ de 64 ans laparotomie pour abdomen aigu

Hypoxémie et instabilité hémodynamique

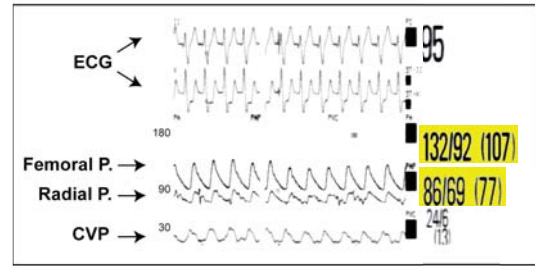


Radial artery pressure monitoring underestimates central arterial pressure during vasopressor therapy in critically ill surgical patients



Abnormal aortic-to-radial arterial pressure gradients resulting in misdiagnosis of hemodynamic instability

André Denault, MD · Alain Deschamps, MD, PhD



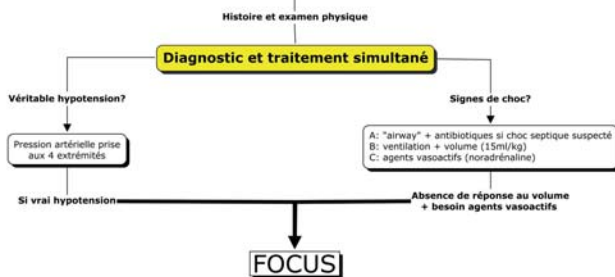
© Canadian Anesthesiologists' Society 2009



Hypoxémie et instabilité hémodynamique

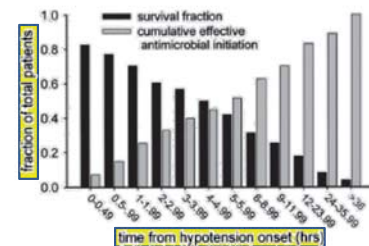


Hypoxémie et instabilité hémodynamique



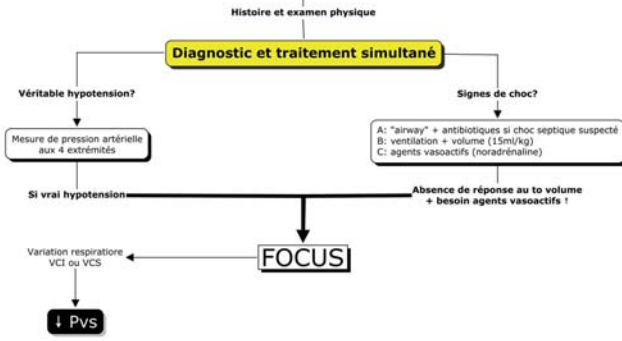
Duration of hypotension before initiation of effective antimicrobial therapy is the critical determinant of survival in human septic shock*

Anand Kumar, MD; Daniel Roberts, MD; Kenneth E. Wood, DO; Bruce Light, MD; Joseph E. Parrillo, MD; Satendra Sharma, MD; Robert Suppes, BSc; Daniel Feinstein, MD; Sergio Zanotti, MD; Leo Taiberg, MD; David Gurka, MD; Aseem Kumar, PhD; Mary Cheang, MSc



(Crit Care Med 2006; 34:1589-1596)

Hypoxémie et instabilité hémodynamique



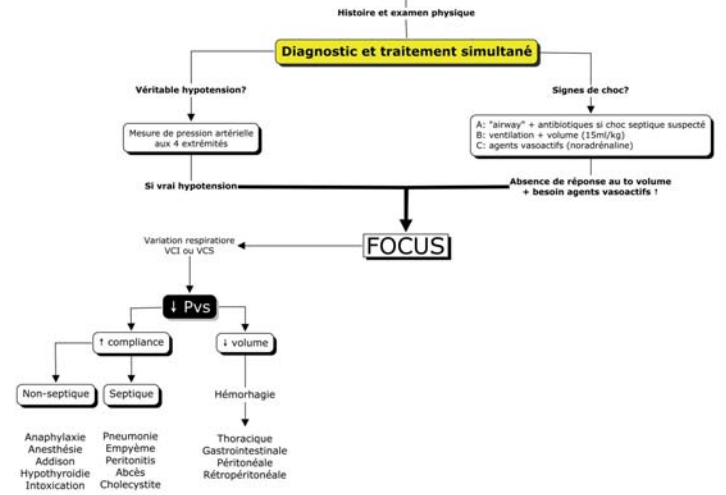
Hypoxémie et instabilité hémodynamique

Avant

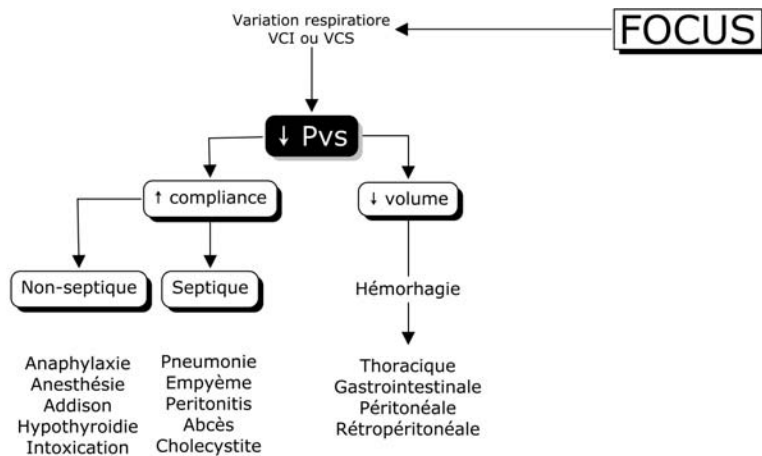
Après



Teboul Intensive Care Med 2013



↓ Pvs: pourquoi?



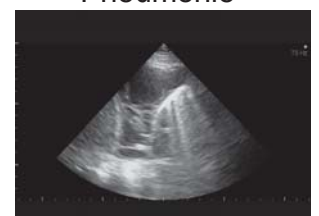
Hémothorax



Pneumonie

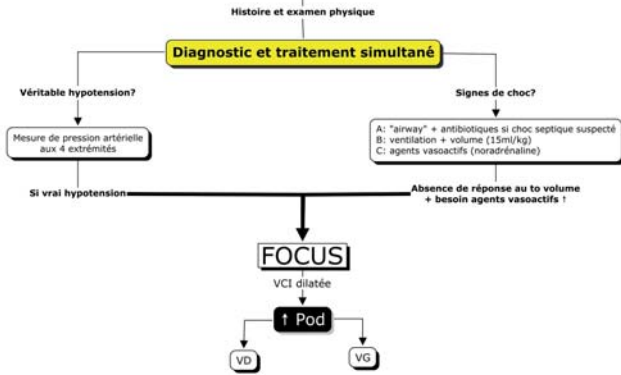


Péritonite

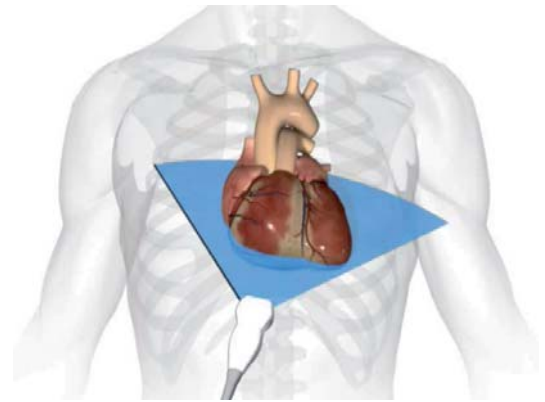


Empyème

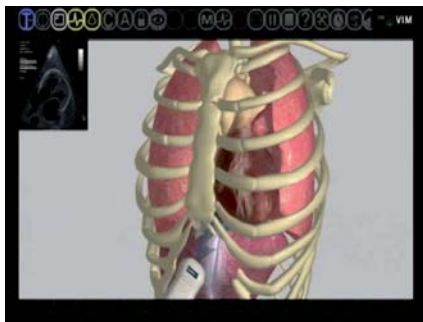
Hypoxémie et instabilité hémodynamique



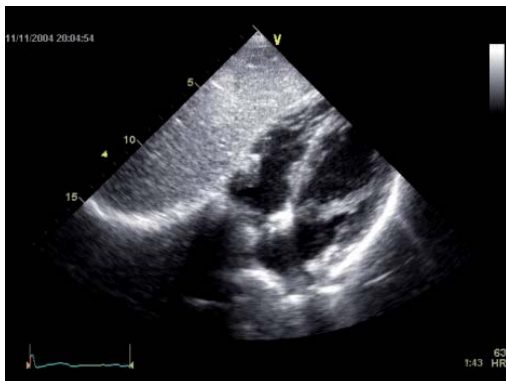
Vue sous-costale 0°



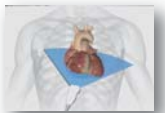
Vue sous-costale 0°



Examen normal



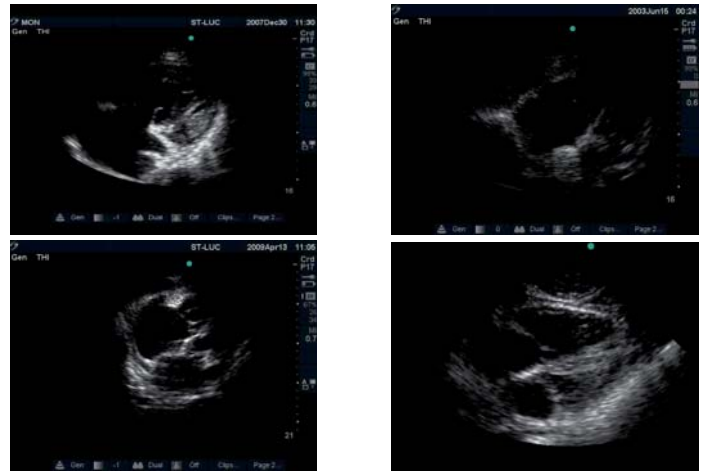
♂ 25 ans post-op laparotomie pour une perforation abdominale
Noradrénaline 0.17 ug/kg/m (50ml/h)



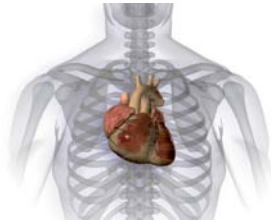
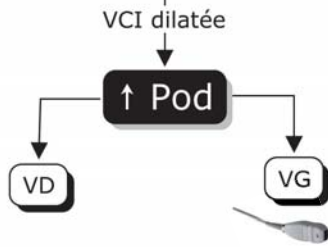
♂ 25 ans post-op laparotomie
pour une perforation abdominale
Noradrénaline cessée après 2h de dobutamine



Dysfonction droite



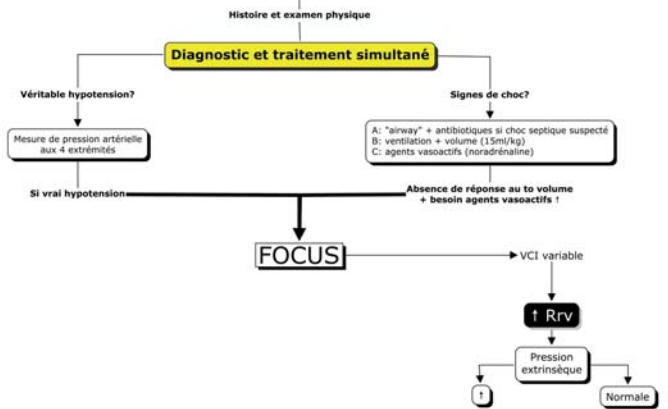
FOCUS



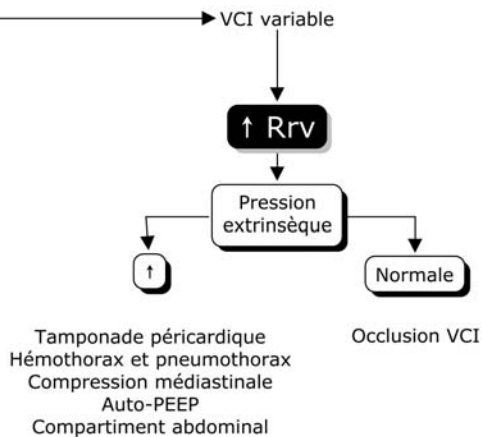
Hypoxémie et hypercapnie
Dysfonction systolique
Dysfonction diastolique
Obstruction chambres de chasse
Embolie pulmonaire

Autre: congénital,
cardiomyopathies,
tumeur, arythmies

Hypoxémie et instabilité hémodynamique



FOCUS



Exemples de choc obstructif

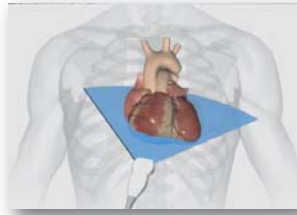
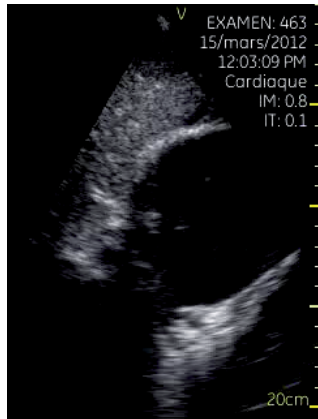
Échographie utile:

- Tamponade cardiaque
- Hémothorax ou pneumothorax sous tension
- Compartiment abdominal

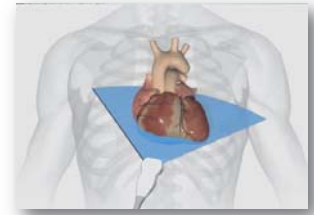
Échographie peu utile:

- Auto-PEEP
- Tamponade médiastinale
- Femme enceinte en décubitus dorsal

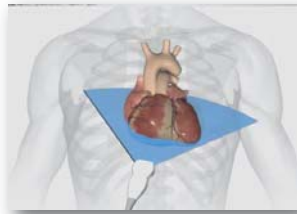
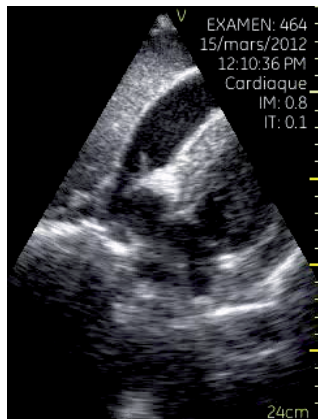
Code bleu ♂ 24 ans cirrhose et insuffisance rénale:



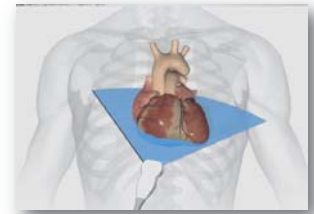
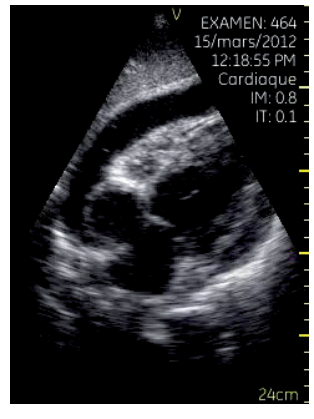
Code bleu ♂ 24 ans cirrhose et insuffisance rénale:



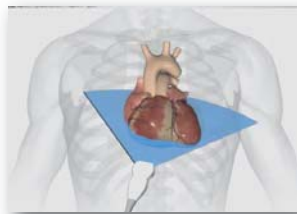
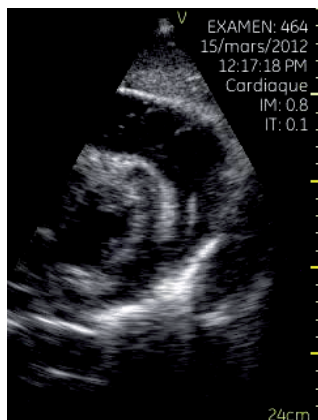
Code bleu ♂ 24 ans cirrhose et insuffisance rénale:



Code bleu ♂ 24 ans cirrhose et insuffisance rénale:
Effet de noradrénaline et volume

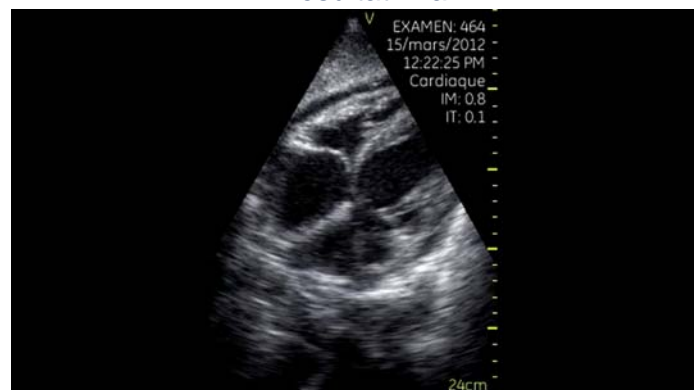


Code bleu ♂ 24 ans cirrhose et insuffisance rénale:

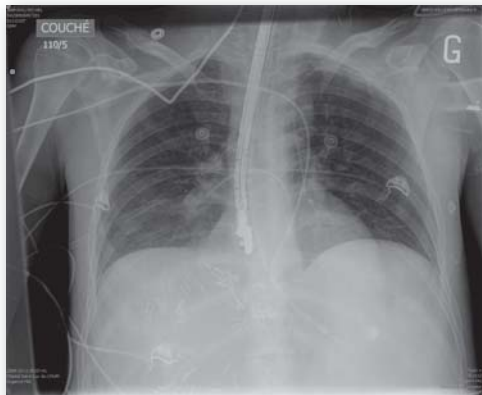


Code bleu ♂ 24 ans cirrhose et insuffisance rénale:

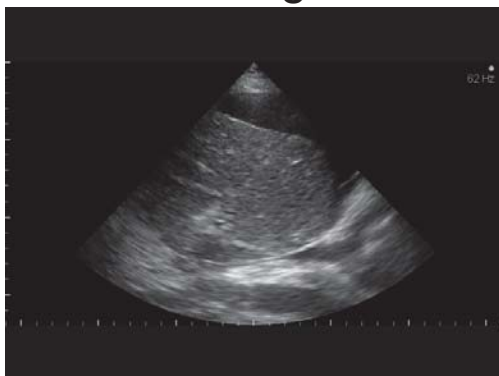
Résultat final



♂ 42 ans hypotension et désaturation post-opératoire



Hypotension post-op chirurgie abdominale



Courtoisie Dr Philippe Rola

♀ 58 ans hypotendu status asthmaticus



Limitations de l'échographie-ciblée

- Examen opérateur-dépendant
- Disponibilités de l'équipement et des modalités associées (Doppler)
- Études sur l'impact de son utilisation

Deep Impact of Ultrasound in the Intensive Care Unit

The "ICU-sound" Protocol

Emilpaolo Manno, M.D.,* Mauro Navarra, M.D.,† Luciana Faccio, M.D.,† Mohsen Motevallian, M.D.,† Luca Bertolaccini, M.D., Ph.D.,‡ Abdou Mfochivè, M.D.,† Marco Pesce, M.D.,† Andrea Evangelista, M.S.§



- Impact
Modification de la prise en charge chez 32/125 patients (25.6%)

Limitations de l'échographie-ciblée

- Examen opérateur-dépendant
- Disponibilités de l'équipement et des modalités associées (Doppler)
- Études sur l'impact de son utilisation
- Aucun effet secondaire?
 - Diagnostic manqué: médico-légal
 - Diagnostic suspecté et non-confirmé: anxiété inutile

Ou est l'erreur?



En résumé

En résumé

État de choc

Hypotension
Oligurie
Extrémités froides
Altération neurologique
Acidose

Ultrasonography in the Intensive Care Unit

Looking at the World through Colored Glasses

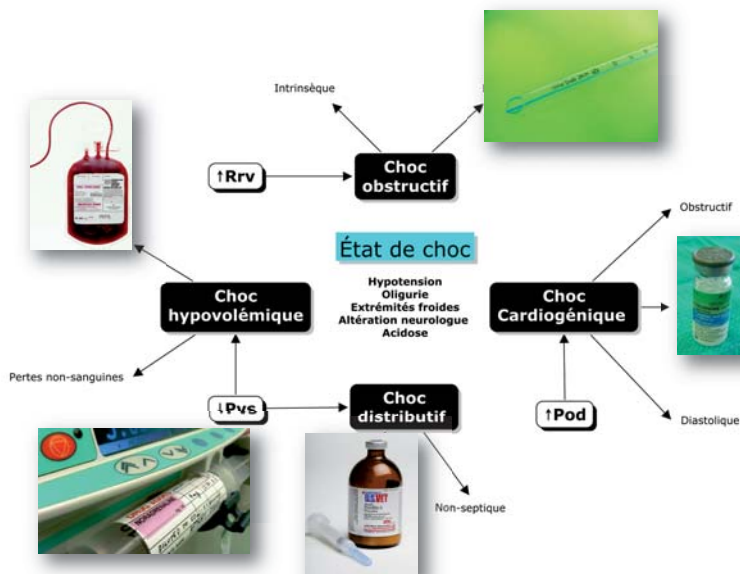
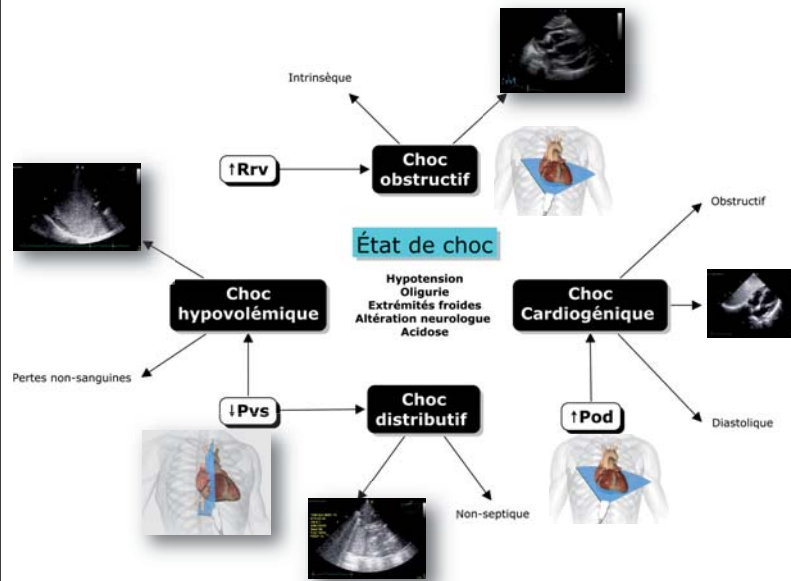
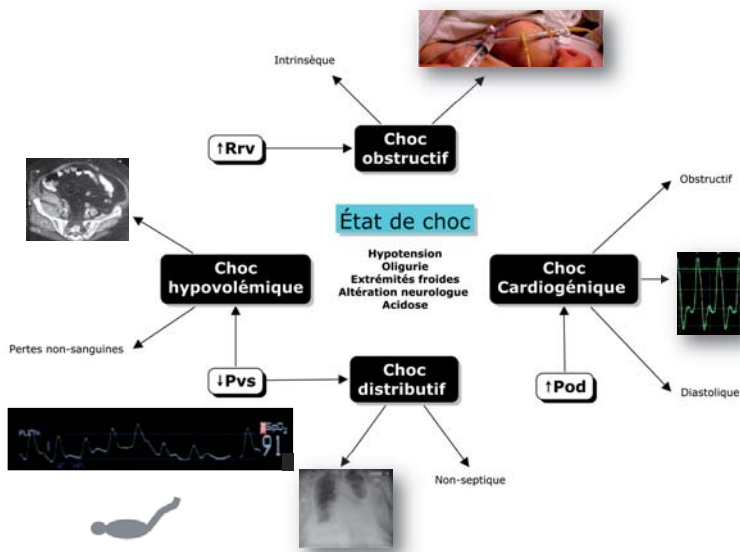


Paolo Pelosi, M.D., Francesco Corradi, M.D., Ph.D.,
Department of Surgical Sciences and Integrated Diagnostics,
University of Genoa, Genoa, Italy. ppelosi@hotmail.com

"... ultrasonography has become an invaluable tool in the management of critically ill and injured patients, which makes it imperative for critical care physicians to stay up to date with this advanced modality."

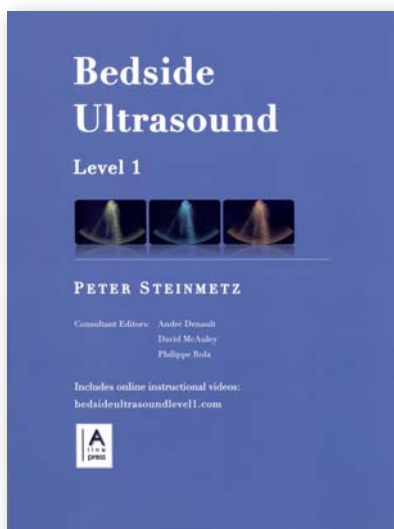
Anesthesiology 2012

ACUTE DYSPNEA WITH OXYGEN DESATURATION							
DRY LUNG			WET LUNG			LUNG POINT	
HORIZONTAL ARTIFACTS			VERTICAL ARTIFACTS		MIXED ECHOTEXTURE		
EXPANDED	EXPANDED	COLLAPSED	EXPANDED	VARIABLE	VARIABLE	EXPANDED	
PERICARDIAL EFFUSION	RIGHT HEART ENLARGED	SYSTOLIC ANTERIOR MOTION of MV	HYPOKINESIA/ AKINESIA	SEVERE VALVULOPATHY	VARIABLE	VARIABLE	VARIABLE/ REDUCED
CARDIAC TAMPONADE	PULMONARY EMBOLISM with SHOCK	LEFT VENTRICULAR OUTFLOW OBSTRUCTION	MYOCARDIAL INFARCTION	AORTIC STENOSIS/ REGURGITATION	ACUTE RESPIRATORY DISTRESS SYNDROME	PNEUMONIA/ ATELECTASIS	TENSION PNEUMOTHORAX with SHOCK
HEART FAILURE				LUNG FAILURE			
GOAL DIRECTED THERAPY							





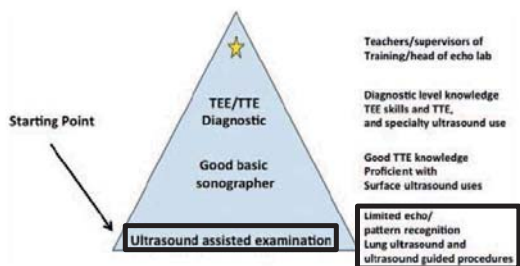
Courtoisie du Dr Reda Salem



Beth Israel Deaconess, Boston Septembre 2013

Core Review: Physician-Performed Ultrasound: The Time Has Come for Routine Use in Acute Care Medicine

Colin F. Royse, MBBS, MD, FANZCA,*† David J. Canty, MBBS, FANZCA, PGDipEcho,*‡§||
 John Faris, MBChB, DAvMed, FAFOM, FFOM, FANZCA, BA, ASCeXAM, PGDipClinUs,¶##**††
 Darsim L. Haji, MBChB, FACEM, PGDipEcho,†† Michael Veltman, MBBS, FANZCA, ASCExam,
 FASE,‡##**§§ and Alistair Royse, MBBS, MD, FRACS, FCSANZ|||

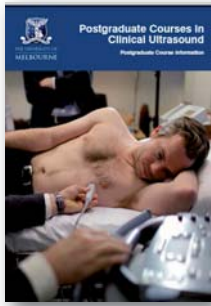


Anesthesia & Analgesia 2012



Colin F. Royse MBBS, MD, FANZCA
 David J Canty MBBS, MD, PGDipEcho

www.heartweb.com

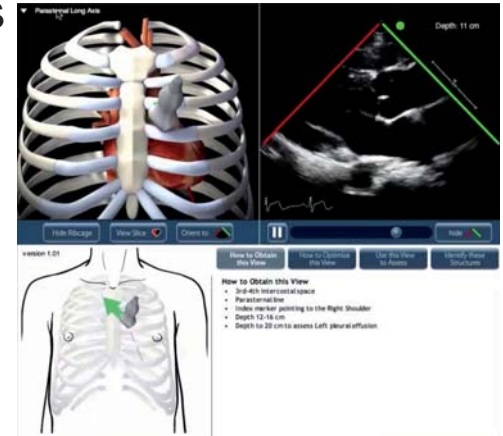


Ultrasound Education Group
Applications Open

[Click to download Course brochure](#)

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Ressources



<http://pie.med.utoronto.ca/tte>



CCUS 2014 – 7th edition From Head to Toe: The Echo-Assisted Physical Examination

May 10th and 11th, 2014
Santa Cabrini Hospital, Montreal

This year, the focus will be on the use of ultrasound for the system and symptom-based assessment of any patient, whether on the wards, in the ER or in the ICU. Learn how to use ultrasound in the assessment of the patient with:

- ✓ decreased level of consciousness
- ✓ renal failure
- ✓ acute abdomen
- ✓ shock
- ✓ pleural effusion or ascites
- ✓ respiratory failure
- ✓ heart failure
- ✓ swollen leg
- ✓ arthritis
- ✓ broken bones

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CAE Healthcare MONTREAL HEART INSTITUTE AFFILIATED WITH Université de Montréal

ICCU Seminar Series
Hands-on Transesophageal Echocardiography Workshop

EVENT DATE & LOCATION
November 29th 2013
(8 hours Workshop)
Montreal, Quebec
At the Montreal Heart Institute

Price: \$1,500 US per participant + applicable taxes
Includes a 1 year license to the TEE e-Learning ultrasound curriculum that must be completed before the event

[More Info and Online Registration](#)

This is a collaborative educational effort between CAE Healthcare and the Montreal Heart Institute

Course Director:
André Denault, M.D., Ph.D., FRCPC, ABIM-CCM, FASE
Cardiac Anesthesiologist and Critical Care Physician
Clinical Professor
Department of Anesthesiology and Critical Care Division
Université de Montréal andre.denault@umontreal.ca



Denis Babin M.Sc. Env.
Assistant de recherche
Inhalothérapeute

Remerciements

Ressources

andre.denault@umontreal.ca

